Peaceful Nuclear Cooperation

U.S. Support for NPT Article IV

UNITED STATES & BRAZIL

Through the International Atomic Energy Agency (IAEA), the United States contributes to the work of many countries using nuclear materials and technology for peaceful purposes. In recent years, U.S. support has focused on achieving tangible and lasting benefits in fields that are vital to human development, including agriculture, human health, water resource management, and human resource development. Since 2000, the IAEA has approved and funded $11,992,720, including $530,700 in 2013, under its Technical Cooperation (TC) program for projects in Brazil.

In addition to the United States' longstanding support for the IAEA's activities to promote peaceful nuclear applications, at the 2010 NPT Review Conference, the United States announced a $100 million USD effort to expand this support over the next five years. The United States has pledged $50 million towards the IAEA's Peaceful Uses Initiative (PUI), focusing on human health, food security, water resource management, and nuclear power infrastructure development.

The United States views its support for peaceful uses of nuclear energy, to which all NPT Parties are entitled, as a critical part of its broader effort to strengthen the IAEA and the global nuclear nonproliferation regime. The U.S. has already designated over $22 million for IAEA projects benefitting over 120 countries, including Brazil, for which funding was previously unavailable. The United States is working with partners to reach the $100 million goal, and welcomes Japan, the Republic of Korea, New Zealand, the Czech Republic, Hungary, Sweden, Australia, France, Indonesia, Brazil, Italy, the UK and Kazakhstan who have announced their own commitments to the PUI of over $12 million.

NUCLEAR ENERGY

With two nuclear reactors in operation and another under construction, Brazil plans to increase its production of electricity with nuclear power. With enough uranium deposits to feed its domestic nuclear energy needs and possibly even to export a few tons annually, Brazil is participating in a regional TC project supported by the United States to obtain a self-supply of uranium for its nuclear plans while causing the least possible adverse impact on the environment. New professionals need to be trained and new cutting edge equipment must be acquired in order for Brazil to exploit new uranium deposits and to produce uranium concentrates in a way that is environmentally sustainable.

AGRICULTURE

Food systems in developing countries are not always as developed as in the industrialized world, and when the quality and safety of food supplies suffers, the people in those countries are therefore exposed to a wide range of potential food quality and safety risks. Additionally, for most developing countries, agriculture lies at the center of their economies and food exports are a major source of foreign exchange and income generation, but access to food export markets depends on their capacity to meet the regulatory requirements of importing countries. Brazil is therefore participating in a regional TC project supported by the United States to ensure food safety, promote good agricultural and production practices, and enhance food exports by using nuclear techniques to monitor chemical residues and contaminants in food products.

Brazil is also participating in a project, coordinated by the IAEA's Department of Nuclear Sciences and Applications and supported by the United States, to implement capacity building activities to improve food safety and quality through nuclear technology and networking. The project involves workshops, human resource training, and technology transfers, and aims to establish functional networks, raise

1. *Power plant under construction. Credit: Kansai Electric Power Co.*
2. *Scientists are constantly looking at ways to improve crops using nuclear techniques. Credit: Centro Energia Nuclear Agricultura, CENA/USP*
3. *Nuclear analytical techniques can evaluate how well food, fortified with essential nutrients and minerals, sustains the body's health and growth. Credit: IAEA*

awareness of food safety and conduct food safety gap analysis in selected countries.

HUMAN HEALTH

Early and accurate diagnosis is vital for effective treatment of both heart disease and cancer. The diagnostic and therapeutic applications of nuclear medicine techniques play a pivotal role in the management of these patients, improving the quality of life by means of an early diagnosis allowing opportune and proper therapy.

With cardiovascular disease as the leading cause of death in most Latin American countries and almost 800,000 new cases of cancer in the region each year, Brazil is currently working through a regional TC project supported by the United States to improve the management of cardiac diseases and cancer patients by strengthening nuclear medicine techniques in Latin America and the Caribbean region.

Latin America also faces a double burden today: on the one hand, under-nutrition, and on the other hand, obesity. Brazil is therefore participating in a regional TC project supported by the United States to improve the capacity of key institutions to use nuclear techniques to address each extreme of malnutrition. These techniques include isotopic dilution with deuterium to assess body composition, as well as carbon-13 to measure fat and glucose oxidation. The project will improve the quality of programs in the region; contribute tools for the diagnosis and evaluation of micronutrient deficiencies, obesity and obesity-related chronic diseases; as well as allow the establishment of data for those programs, which will help in the identification of vulnerable groups, planning, and the prioritization of actions to be applied.

NUCLEAR SAFETY

Disused facilities and sites contaminated because of activities involving the use of radioactive material exist worldwide and many pose continuing health risks to adjacent communities and, potentially, to the wider public. Brazil is currently participating in an interregional TC project supported by the United States that will provide support and assistance toward the efficient clean-up of radioactive contaminated facilities and sites. Through this project, barriers to the acceptance of continued or expanded applications of peaceful uses of nuclear technology can, to some extent, be removed.

Human resource development is critical for Member States to be able to implement and sustain nuclear security, so Brazil is also participating in a regional TC project supported by the United States to implement the component of the IAEA Nuclear Security Plan 2010-2013 which focuses on institutional capacity building, human resource development and educational programs. Strengthening nuclear security human resource development will contribute to sustained effective nuclear security worldwide.

HUMAN RESOURCES

To contribute to Member States' manpower development, the IAEA awards individual fellowships and organizes group training courses. Every year, numerous fellows and training course participants travel to the United States for training in various peaceful uses of nuclear technology and return to their home country to apply the lessons learned.

Since 2000, the United States has hosted multiple training courses that included Brazilian participants in fields such as decommissioning, insect pest control, nuclear safety and security, food irradiation, environmental remediation, groundwater hydrology, quality assurance in radiotherapy, and developing national long-range nuclear energy strategies. Training was also provided through the IAEA Fellowship Program to 101 Brazilians, 24 of which were sponsored by the United States, in fields including radiation medicine and health, radiation metrology and dosimetry, nuclear and radiation safety and security, nuclear instrumentation, and insect pest control.

Additionally, since 2000, 65 U.S. experts have traveled to Brazil to collaborate through various IAEA Technical Cooperation projects. Examples of some topics include vibration monitoring systems, tomographic systems, radioactivity measurements, isotopes, nuclear power, safety culture, and fatigue analysis.

1. *Tissue cultures are studied at a nuclear energy center for agriculture. Credit: CENA/Brazil*
2. *IAEA helps countries safety condition and seal spent radioactive sources. Credit: Kirstie Hansen/IAEA*
3. *Radiotherapy center. Credit: Rodolfo Quevenco/IAEA*
4. *IAEA fellows receive training. Credit: Dean Calma/IAEA*

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